

**MEMORANDUM**

**DATE:** August 18, 2014  
**TO:** John Wallace – UW  
**FROM:** Tom Mergy - PBS  
**PROJECT NO:** 40035.590  
**RE:** **UW 203512 - Maple Terry Hall –PCB Cleanup Response Comments**

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At your request, PBS Engineering & Environmental, Inc. (PBS) is providing a response to the EPA Comments regarding the PCB Soil Cleanup under Terry Hall, from Michelle Mullin, PCB Coordinator US EPA Region 10 dated Wednesday, July 30, 2014

Reference: June 6, 2014: John Wallace submitted a status report to EPA, and requested a review and comment of UW's most recent status and of our intentions moving forward.

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EPA comments are presented as received, by number. PBS responses are in *italic*.

1. Can you provide the figures that show the sample locations and PCB results?

*Figures 2 and 3, as contained in the PCB Summary Report, June 6, 2014, display the sample locations. Table 1 summarizes the lab results and corresponds to sample locations/IDs presented on Figures 2 and 3. PBS will draft an additional figure (fig 4) that will show relationship of the PCB excavation in relation to the Terry Hall foundation plan.*

2. Can you provide the specifications of the fill and “cap” ie, building foundation that will be overlain on top of the contamination? Please also document that it is in compliance with any state of WA cap requirements. Ideally, it would be in compliance with 761.61(a)(7) as well, but this is not a requirement under a risk-based disposal application. If you are deviating from the (a)(7) specifications though, please provide justification.

*The residual pcb in soil in the excavation was located at 6 to 8 feet below the foundation grade. The fill and cap placed above the residual pcb in soil will be completed by using a control density fill (CDF) material placed into the open excavation to approximately 8 feet deep. The final cap will consist of a vapor membrane overlaying the 8-feet of CDF plus by a 4-inch thick concrete slab to be placed above the CDF and vapor membrane. The reinforced concrete slab will be the base of the sub-grade parking garage under newly constructed Terry Hall. The fill and cap will substantially comply with Washington Department of Ecology criteria and 40CFR 761.61(a) section 7, as referenced below. PBS will provide further details and specification of the fill and cap to document permanence of the cap.*



**Reference: Regulatory Requirements of 40 CFR 761.61(a) (7) Cap requirements.** *A cap means, when referring to on-site cleanup and disposal of PCB remediation waste, a uniform placement of concrete, asphalt, or similar material of minimum thickness spread over the area where remediation waste was removed or left in place in order to prevent or minimize human exposure, infiltration of water, and erosion. Any person designing and constructing a cap must do so in accordance with §264.310(a) of this chapter, and ensure that it complies with the permeability, sieve, liquid limit, and plasticity index parameters in §761.75(b)(1)(ii) through (b)(1)(v). A cap of compacted soil shall have a minimum thickness of 25 cm (10 inches). A concrete or asphalt cap shall have a minimum thickness of 15 cm (6 inches). A cap must be of sufficient strength to maintain its effectiveness and integrity during the use of the cap surface which is exposed to the environment. A cap shall not be contaminated at a level  $\geq 1$  ppm PCB per Aroclor<sup>TM</sup> (or equivalent) or per congener. Repairs shall begin within 72 hours of discovery for any breaches which would impair the integrity of the cap.*

3. The summary report mentions that water infiltration is observed in the excavation. EPA is concerned that this may provide a migration pathway to receptors in the environment. Please provide an analysis and conceptual site model for ground water and surface water flow at the site.

*The water seepage observed in the excavation was related to surface precipitation and infiltration of moisture contained under the concrete building slab. At this time, data collected in surrounding subsurface explorations indicates the groundwater table is present at about 48 feet below ground surface, which is approximate 20 feet below the base of the pcb excavation. Surface water routes do not appear to be a complete pathway, but will be fully reviewed under the conceptual site model (CSM). A CSM will be prepared to examine potential pathways and exposure routes of the residual pcb in soil.*

4. The summary report identifies PCBs in excess of 2,000 ppm to the east and >200 ppm beneath the current excavation boundaries. Please provide a conceptual site model that describes the pathways of migration and an explanation for why such high concentrations have mobilized so far from the source.

*A conceptual site model (CSM) will be prepared to examine potential migration pathways of the pcb in soil from the initial source area. The footprint of the former transformer room contained an expansion joint in the concrete floor perimeter of the room. PCB containing oil seeped through these expansion joints and distributed pcb beneath this footprint. The 2,000 ppm concentration was in proximity of former foundation features that extended about 3 feet below the former concrete slab. Additionally, relatively loose sand material was encountered in the excavation along the east portion that may have allowed for the deeper migration of the pcbs.*

5. In order for institutional controls, such as marking and occupancy and deed restrictions to be effective, the full extent of contamination must be understood. While excavation may be impractical due to engineering concerns, characterization should still be feasible. Please collect additional samples until the full depth and lateral extent of PCB contamination is identified.

*Existing construction and foundation considerations at the project area restricted the ability to excavate deeper or laterally to the east. The current ten-story building infrastructure presents limited access to project area and will be integral consideration in any approach for proposed site characterization. The CSM evaluation (see question #4) of the existing subsurface conditions and contamination data may provide sufficient understanding of the fate and transport of the contamination, and minimize the need for subsequent subsurface investigation to define the extent of the pcb contamination.*

6. In your letter you mentioned Institutional Controls consisting of marking the building plans, limiting access to the area and listing the site on the GIS map of contaminated sites managed by the University. EPA will require compliance with 761.61(a)(8)- use of a deed restriction restricting use of the lower level of the building to low-occupancy and of the existence of a cap and requirement to maintain the cap, in addition to the other items listed in that paragraph.

*Institutional controls are a mechanism that the University has employed, and would comply with 761.61(a)(8) as described in the UW's June 6, 2014 letter and as referenced below. The project location is a low occupancy area, as it is located beneath the parking garage structure concrete slab.*

**Reference: CFR 761.61(a)(8) Deed restrictions for caps, fences and low occupancy areas.** *When a cleanup activity conducted under this section includes the use of a fence or a cap, the owner of the site must maintain the fence or cap, in perpetuity. In addition, whenever a cap, or the procedures and requirements for a low occupancy area, is used, the owner of the site must meet the following conditions:*

*(i) Within 60 days of completion of a cleanup activity under this section, the owner of the property shall:*  
*(A) Record, in accordance with State law, a notation on the deed to the property, or on some other instrument which is normally examined during a title search, that will in perpetuity notify any potential purchaser of the property:*

*(1) That the land has been used for PCB remediation waste disposal and is restricted to use as a low occupancy area as defined in §761.3.*

*(2) Of the existence of the fence or cap and the requirement to maintain the fence or cap.*

*(3) The applicable cleanup levels left at the site, inside the fence, and/or under the cap.*

*(B) Submit a certification, signed by the owner, that he/she has recorded the notation specified in paragraph (a)(8)(i)(A) of this section to the EPA Regional Administrator.*

*(ii) The owner of a site being cleaned up under this section may remove a fence or cap after conducting additional cleanup activities and achieving cleanup levels, specified in paragraph (a)(4) of this section, which do not require a cap or fence. The owner may remove the notice on the deed no earlier than 30 days after achieving the cleanup levels specified in this section which do not require a fence or cap.*

**Table 1 - Soil Confirmation Samples - DRAFT**  
**PCB Impacted Soil Excavation**  
**University of Washington - Terry Hall, Seattle, Washington**

Sample ID	Date	Composite or Discrete (C / D)	Total PCBs (mg/kg)
WCW	4/29/2014	C	0.76
SCW	4/29/2014	C	0.069
NWC1	5/1/2014	D	<0.2
NWC2	5/1/2014	D	<0.2
NWC3	5/1/2014	D	<0.2
NWC4	5/1/2014	D	<0.2
NWC5	5/1/2014	D	<0.2
NWC6	5/1/2014	D	<0.2
NWC7	5/1/2014	D	<0.2
EW1	5/1/2014	D	<0.2
EW2	5/1/2014	D	<0.2
EW3	5/1/2014	D	<0.2
EW4	5/1/2014	D	<0.2
EW5	5/1/2014	D	<0.2
EW6	5/1/2014	D	0.59
NSWEC	5/21/2014	C	0.55
NSWWC	5/27/2014	C	0.13
SSWE1	5/22/2014	D	0.11
SSWE2	5/22/2014	D	0.14
SSWE3	5/22/2014	D	<0.02
SSWE4	5/22/2014	D	<0.02
SSWE5	5/22/2014	D	<0.02
SSWE8	6/2/2014	D	0.33
SSW1	5/30/2014	D	<0.02
SSW2	5/30/2014	D	<0.02
SSW3	5/30/2014	D	0.054
SSW4	5/30/2014	D	0.45
SSW5	5/30/2014	D	0.18
SSW6	5/30/2014	D	0.084
ESWSC	5/21/2014	C	0.55
ESWN1	5/21/2014	D	0.070
ESWN2	5/21/2014	D	0.59
ESWN3	5/21/2014	D	<0.02
ESWN7	5/27/2014	D	0.19
ESWN5	5/21/2014	D	0.49
ESWN10	6/2/2014	D	<b>2,500</b>
WSWS1	5/30/2014	D	0.068
WSWS2	5/30/2014	D	0.036

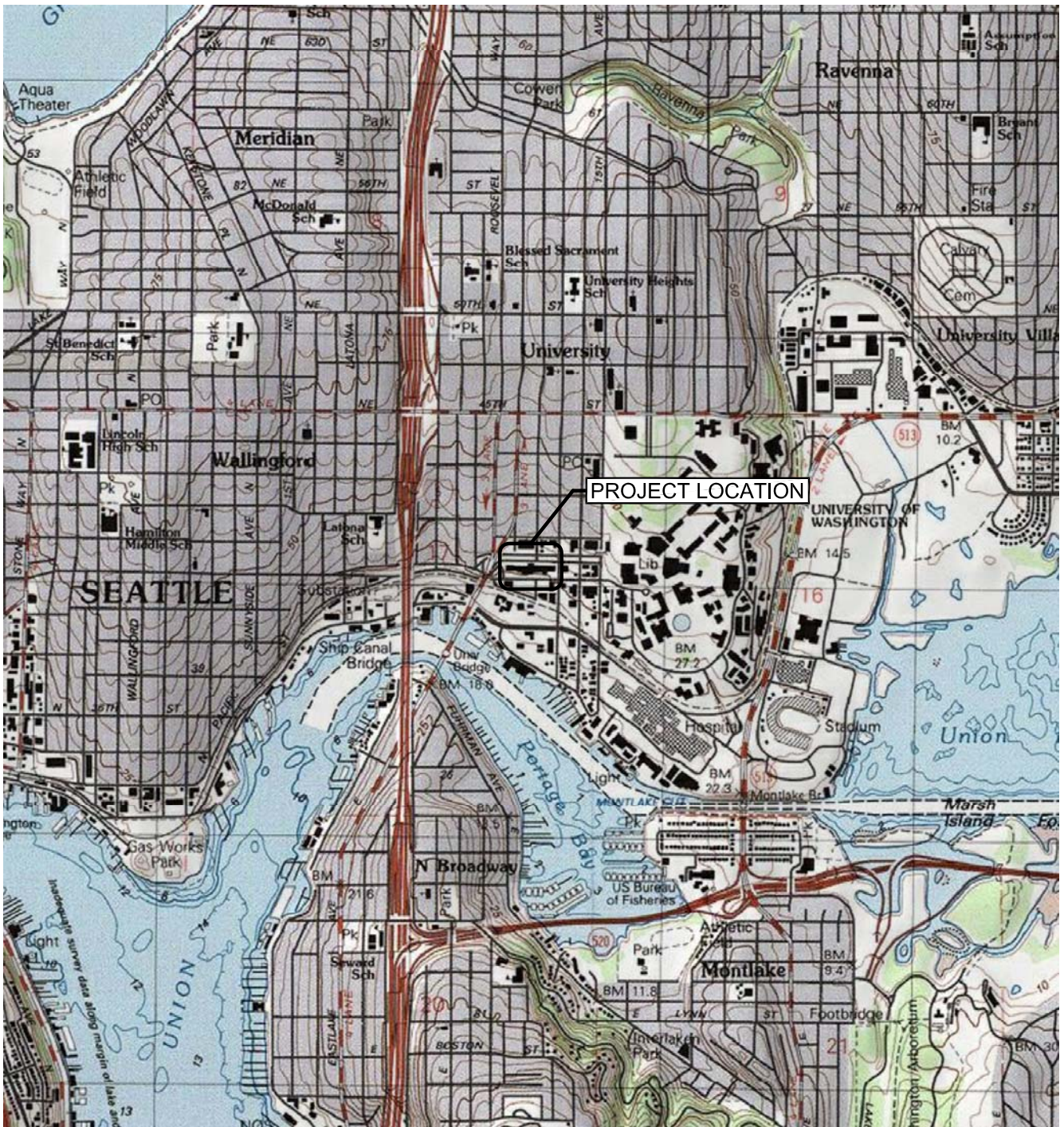
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WSWS3	5/30/2014	D	0.039
WSWS4	5/30/2014	D	<0.02
WSWS5	5/30/2014	D	0.12
WSWS7	6/2/2014	D	0.25
B1	6/3/2014	D	<0.109
B2	6/3/2014	D	<b>12.2</b>
B3	6/3/2014	D	<b>1.72</b>
B4	6/2/2014	D	<0.108
B5	6/2/2014	D	<b>1.43</b>
B6	6/2/2014	D	0.939
B7	6/2/2014	D	0.13
B8	6/3/2014	D	<0.117
B9	6/3/2014	D	<0.110
B10	6/3/2014	D	<0.106
B11	6/2/2014	D	<b>1.19</b>
B12	6/2/2014	D	<b>212</b>
B13	6/2/2014	D	<b>1.16</b>
B14	6/2/2014	D	0.026
B15	6/3/2014	D	<0.119
B16	6/3/2014	D	0.2
B17	6/3/2014	D	<0.02
B18	6/2/2014	D	<b>2.01</b>
B19	6/2/2014	D	<0.109
B20	6/2/2014	D	<0.109
B21	6/2/2014	D	0.056
B22	6/3/2014	D	<0.02
B23	6/3/2014	D	<0.02
B24	6/3/2014	D	0.065
B25	6/2/2014	D	0.18
B26	6/2/2014	D	0.137
B27	6/2/2014	D	<b>1.48</b>
B28	6/2/2014	D	<b>1.9</b>
B29	6/3/2014	D	<b>12</b>
B30	6/3/2014	D	<b>1.2</b>
B31	6/3/2014	D	<0.02
B32	6/2/2014	D	<b>1.3</b>
B33	6/2/2014	D	<b>3.1</b>
B34	6/2/2014	D	0.24
B35	6/2/2014	D	0.033

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SOURCE: USGS SEATTLE NORTH E, WA QUADRANGLE 1979,  
PHOTO REVISED 1983.



WASHINGTON



SCALE: 1" = 150'



PROJECT #  
40035.590

DATE  
JULY 2013

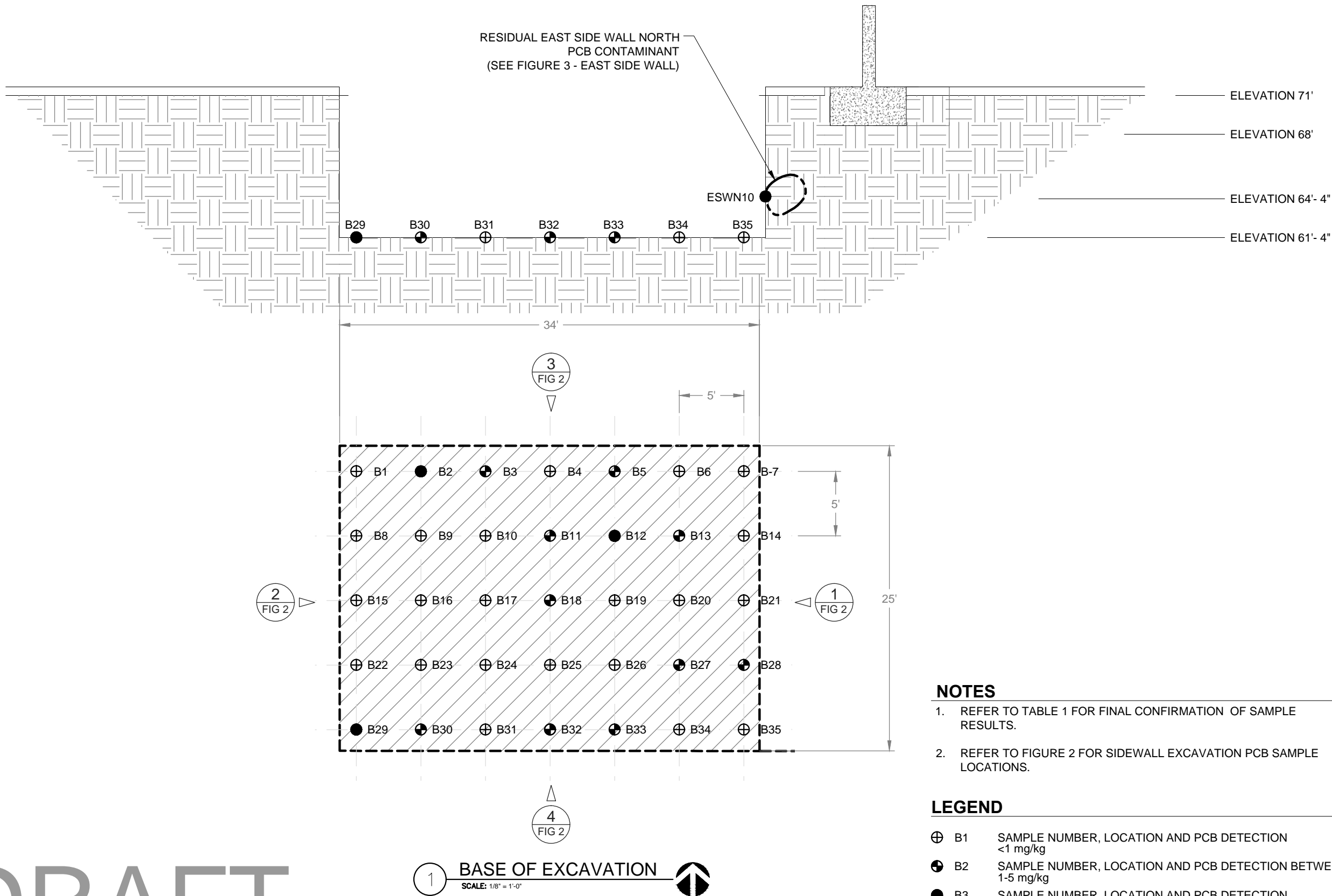
VICINITY MAP  
TERRY HALL - UNIVERSITY OF WASHINGTON  
SEATTLE, WASHINGTON

FIGURE

1

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NOTES

1. REFER TO TABLE 1 FOR FINAL CONFIRMATION OF SAMPLE RESULTS.
2. REFER TO FIGURE 2 FOR SIDEWALL EXCAVATION PCB SAMPLE LOCATIONS.

LEGEND

- ⊕ B1 SAMPLE NUMBER, LOCATION AND PCB DETECTION <1 mg/kg
- ⊕ B2 SAMPLE NUMBER, LOCATION AND PCB DETECTION BETWEEN 1-5 mg/kg
- B3 SAMPLE NUMBER, LOCATION AND PCB DETECTION >5 mg/kg

PCB EXCAVATION SAMPLE LOCATIONS

MAPLE TERRY HALL - UNIVERSITY OF WASHINGTON - 203152  
SEATTLE, WASHINGTON

REMEDIATION

PLAN

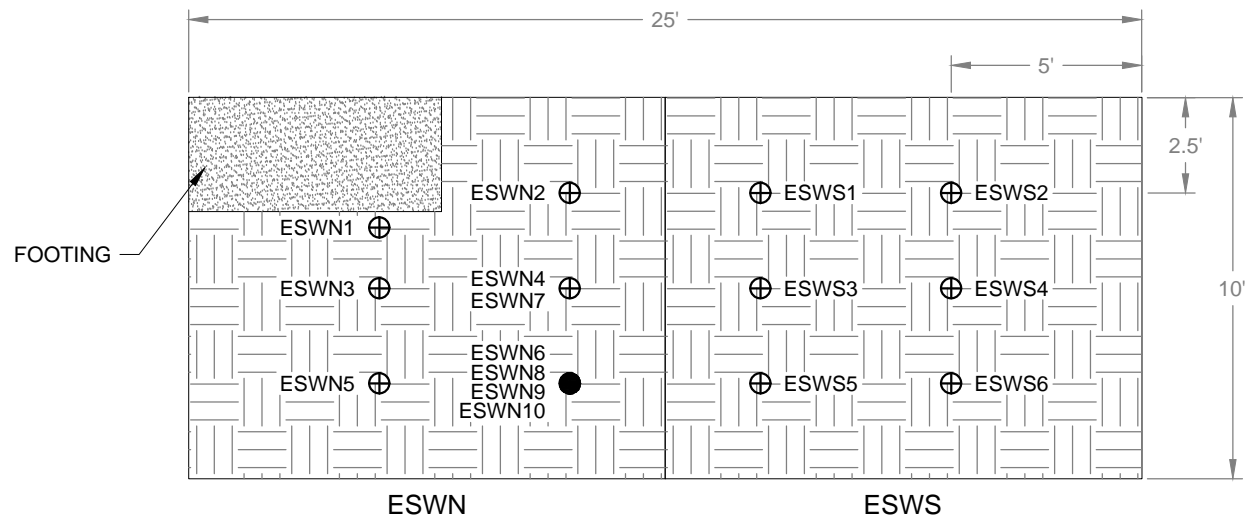
PROJECT: 40035.590

DATE: JUNE 2014

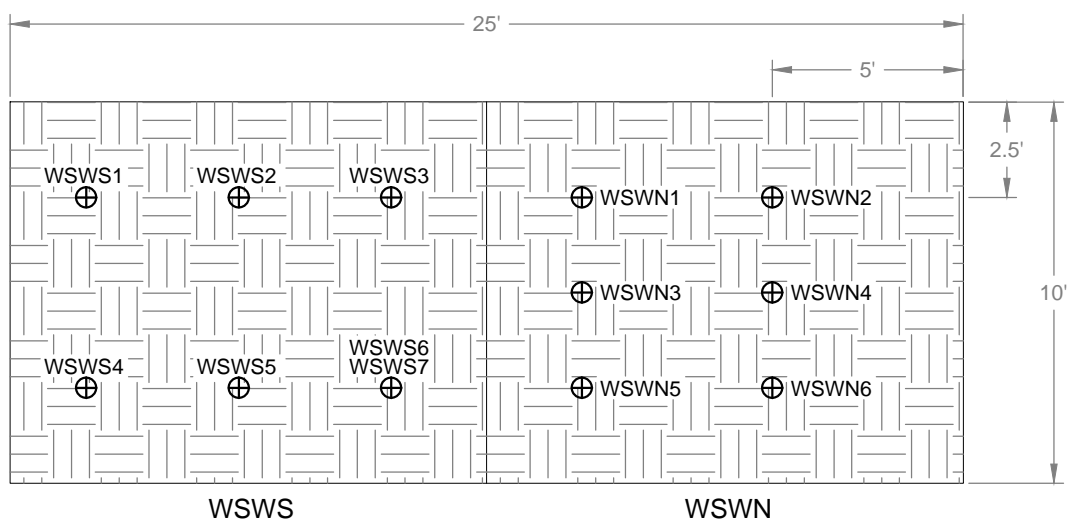
FIGURE:

2

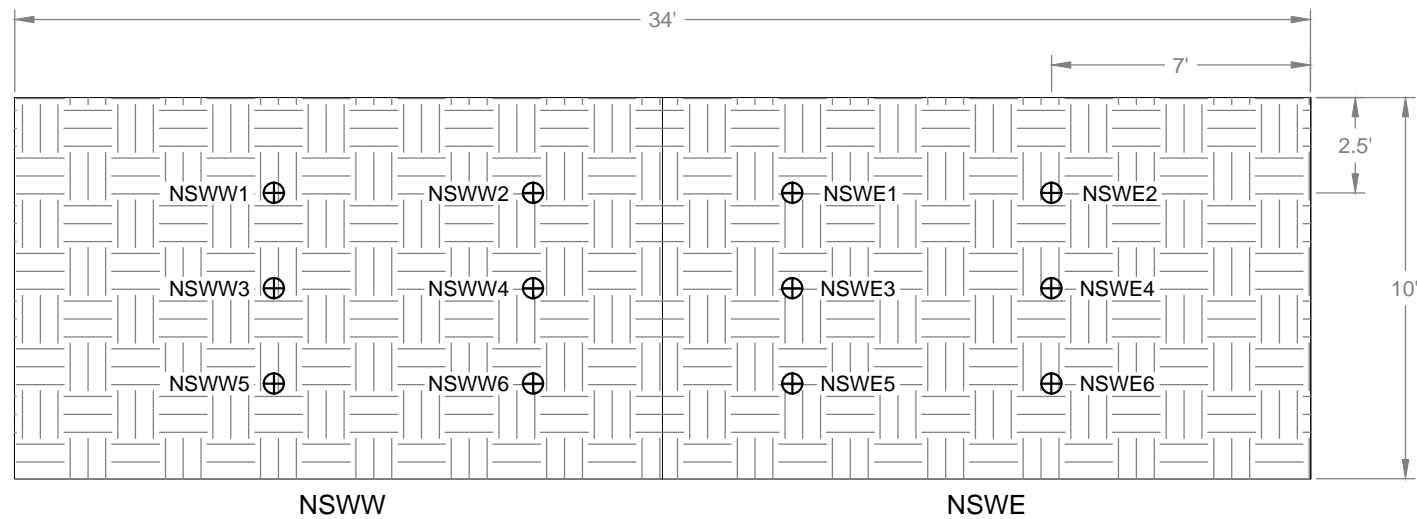
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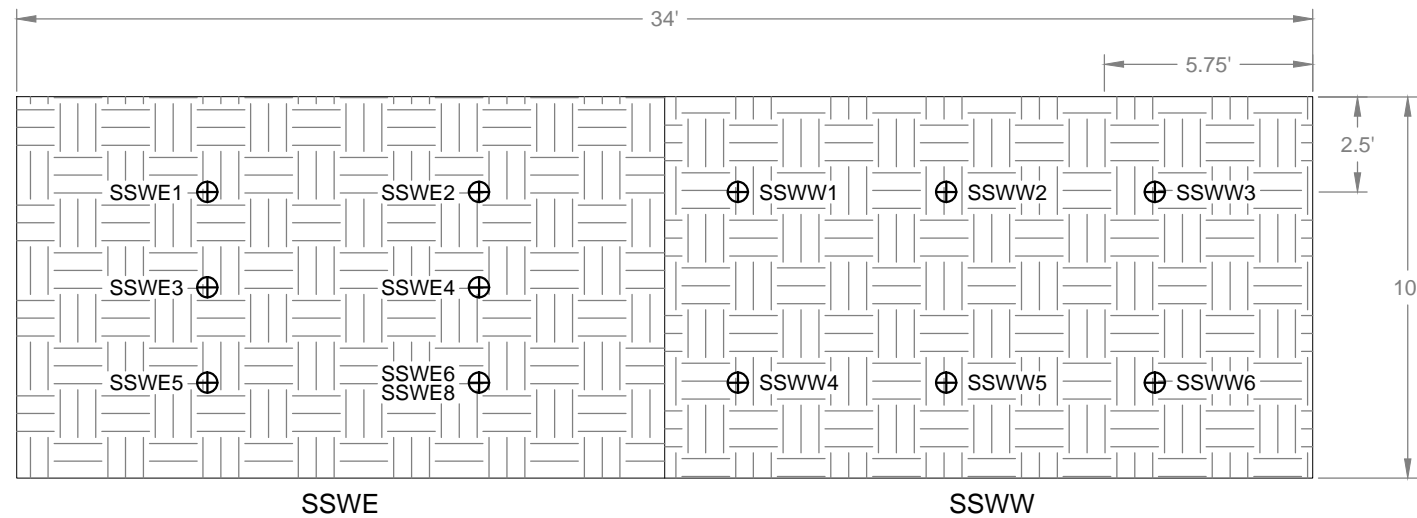
1 EAST SIDEWALL ELEVATIONS  
SCALE: 3/16" = 1'-0"



2 WEST SIDEWALL ELEVATIONS  
SCALE: 3/16" = 1'-0"



3 NORTH SIDEWALL ELEVATIONS  
SCALE: 3/16" = 1'-0"



4 SOUTH SIDEWALL ELEVATIONS  
SCALE: 3/16" = 1'-0"

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#### GENERAL NOTES

- MULTIPLE SAMPLE IDs PER SAMPLE LOCATION REPRESENT AREAS WHERE ADDITIONAL EXCAVATION WAS REQUIRED BASED ON ANALYTICAL RESULTS ABOVE CLEANUP CRITERIA.
- FINAL SAMPLE ID REPRESENTS FINAL CONFIRMATION SAMPLE TAKEN.

#### KEY

- ⊕ SAMPLE PCB DETECTION <1 mg/kg
- SAMPLE PCB DETECTION >5 mg/kg

#### LEGEND

- ⊕ ESWN1 EAST SIDE WALL NORTH SAMPLE NUMBER AND LOCATION
- ⊕ ESWS1 EAST SIDE WALL SOUTH SAMPLE NUMBER AND LOCATION
- ⊕ WWS1 WEST SIDE WALL SOUTH SAMPLE NUMBER AND LOCATION
- ⊕ WSWN1 WEST SIDE WALL NORTH SAMPLE NUMBER AND LOCATION
- ⊕ NSWW1 NORTH SIDE WALL WEST SAMPLE NUMBER AND LOCATION
- ⊕ NSWE1 NORTH SIDE WALL EAST SAMPLE NUMBER AND LOCATION
- ⊕ SSWE1 SOUTH SIDE WALL EAST SAMPLE NUMBER AND LOCATION
- ⊕ SSWW1 SOUTH SIDE WALL WEST SAMPLE NUMBER AND LOCATION



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PCB EXCAVATION SAMPLE LOCATIONS

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REMEDIATION PLAN

ELEVATIONS

PROJECT: 40035.590

DATE: JUNE 2014

FIGURE:

3